LAKE COUNTY

STORMWATER MANAGEMENT COMMISSION

August 12, 1998

Mr. John J. O'Grady
Remedial Project Manager
Superfund Division
USEPA, Region V
77 West Jackson Blvd.
Chicago, IL 60604-3590

Dear Mr. O'Grady,

The City of North Chicago and Lake County Stormwater Management Commission (SMC) are very pleased that a clean-up action is now occurring on this site. However, we do not wish to loose the opportunity to resolve the Pettibone Creek drainage and documented contaminant issues concurrently. Therefore, as you have requested, we have addressed your request by analyzing the upgradient tributary areas for potential source contaminates to the site. This issue has been studied and reviewed by myself and by City Engineer Bruce Burris. Each of us has come to the conclusion that there are no identifiable sources of upgradient contaminants with respect to the site in question.

SMC has previously inventoried (Reach 12) of the Pettibone Creek Watershed (See attached). The landuse is almost entirely residential and the system is storm sewered with some intermittent overland pathways. The tributary in this reach is divided into two forks, comprising of approximately 325 acres. The only identified non-residential uses tributary to the site are the EMCO Chemical Plant The EMCO Chemical Plant has an NPDES permit. Their stormsewer discharges directly into the creek. The smelting plant adjacent to (east) of the site is not tributary to the creek reach of interest.

The City has documented a history of flooded basements due to the stormsewer system in Reach 12 backing up. The creek has accumulated sediment and debris such that the intended overland flow does not occur, unless severe precipitation creates an overtopping effect. SMC has identified this area as the critical area to maintain, which will provide some relief to the chronic flooding in the residential community. Additionally, we fear that these creek related contaminates may re-suspend and backflow into the residential community during severe storm events.

We have received comment from IEPA (attached) with regard to the "re-suspended contaminated sediment" issue related to this maintenance proposal. We offer to you that a temporary earthen diversion into the existing 60" RCP

Richard A. Welton, Chairman Ward S. Miller, Executive Director

333-B Peterson Road • Libertyville, Illinois 60048 • 847/918-5260 • FAX 847/918-9826

laying underneath Commonwealth Ave. be constructed prior to dewatering and excavation in the creek bed and slopes.

We feel confident that your sampling activities in the creek and slope areas during the clean-up operations will identify the need to incorporate these areas into the excavation and removal phase. Therefore, we ask that you perform the on-site analysis and perform the removal action within the creek area as a part of the total site clean-up operation.

The City and SMC are looking forward to working with USEPA, USCOE and the general contractor to assist with and resolve any issues related to this long awaited operation. This multi-benefit, multi-jurisdictional project can prove to be very beneficial related to public health, water quality, aesthetics, land-use and property damage reduction.

Also attached, please find several reference maps and a Phase I Investigation Report.

Sincerely,

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

Fred Royal, Watershed Engineer

Cc: Bruce Burris, P.E., City Engineer, City of North Chicago
Bruce Yurdin, IEPA

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/782-0610

September 21, 1995

Mr. Marion E. Kessy, P. E.
Lake County Stormwater Management Commission
333-B Peterson Road
Libertyville, IL 60048

Re: City of North Chicago (Lake County)
Channel modifications-Pettibone Creek
Log# C-1115-95 [CoE appl.# 199500605]

Dear Mr. Kessy:

We received your application for Section 401 water quality certification and supporting documents concerning the above referenced project on August 25, 1995. The documents, as submitted, have been reviewed by the Permit Section staff, and based on that review, the following items are offered for your consideration and appropriate action.

The project involves the regrading of a 500 foot section of the North Branch of Pettibone Creek, between the Elgin, Joliet and Eastern Railroad and Sheridan Road. As noted in portions of the contract documents ("Special Excavation", page 10; and Appendix A), the sediments in Pettibone Creek area highly contaminated. Other recently collected data from sediment investigations conducted near this location, and continuing into Great Lakes Harbor, indicate that the sediment throughout the North Branch of Pettibone Creek contains very high concentrations of heavy metals and organic compounds. We believe the channel work, as currently proposed, will result in the resuspension and loss of this material to the stream and to Lake Michigan. Under these circumstances, we cannot issue the required water quality certification for this project.

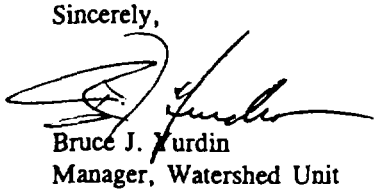
If you propose to continue with this project, plans and specifications for the isolation of the work areas, the removal of the sediment from the channel under dewatered conditions and the transport and disposal of the material will be required. This should include information on the methods proposed for rerouting stream flow around the excavation sites along the channel, the materials and equipment types used and the design of the water tight truck beds or containers used to transport the excavated material. A spill control and prevention plan will also be required.

Since this proposal will result in the covering of the channel bed along the 500 foot segment, but not in the removal of all contaminants from the area, your resubmittal must contain an evaluation of the impacts this limited removal plan will have in terms of the long term stability of the channel bed and the effectiveness of the modification (i.e., the filter fabric and riprap) in isolating the contaminants in-place. As an alternative, North Chicago should consider the removal of all contaminated sediments in the 500 foot long project area. Details of the removal plan under this alternative must include the specific concentrations of contaminants that will remain in the channel. Please provide plans for a confirmatory sediment testing program to ensure that contaminant removal objectives are met following excavation.

Section 401 certification will be held in abeyance pending a review of the requested information. Upon receipt of a satisfactory written reply and supplemental information required, we shall finalize our review of this subject. Your response should be submitted to this office within thirty (30) days.

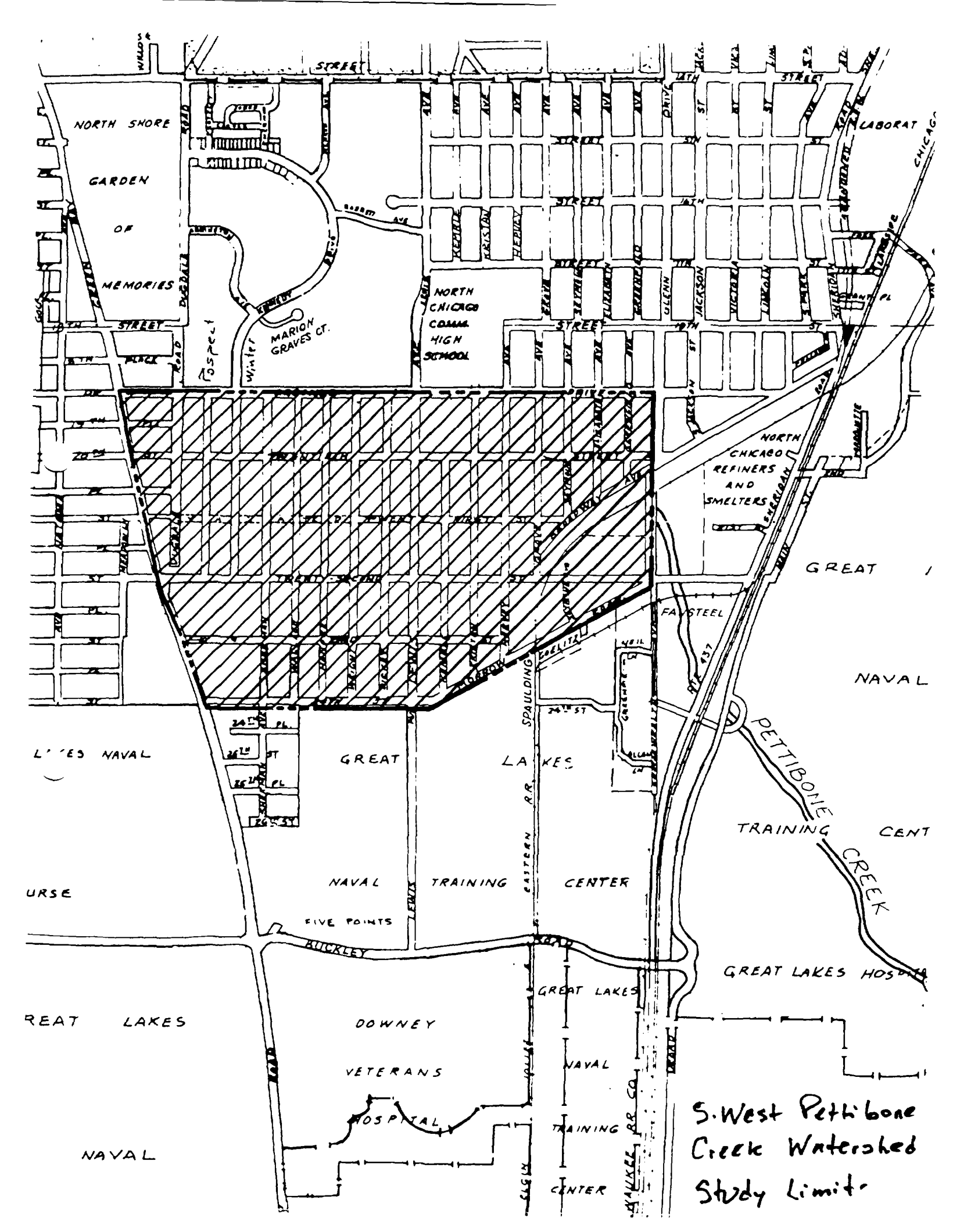
Should you have any questions or comments regarding the content of this letter, please contact me at the above telephone number and address.

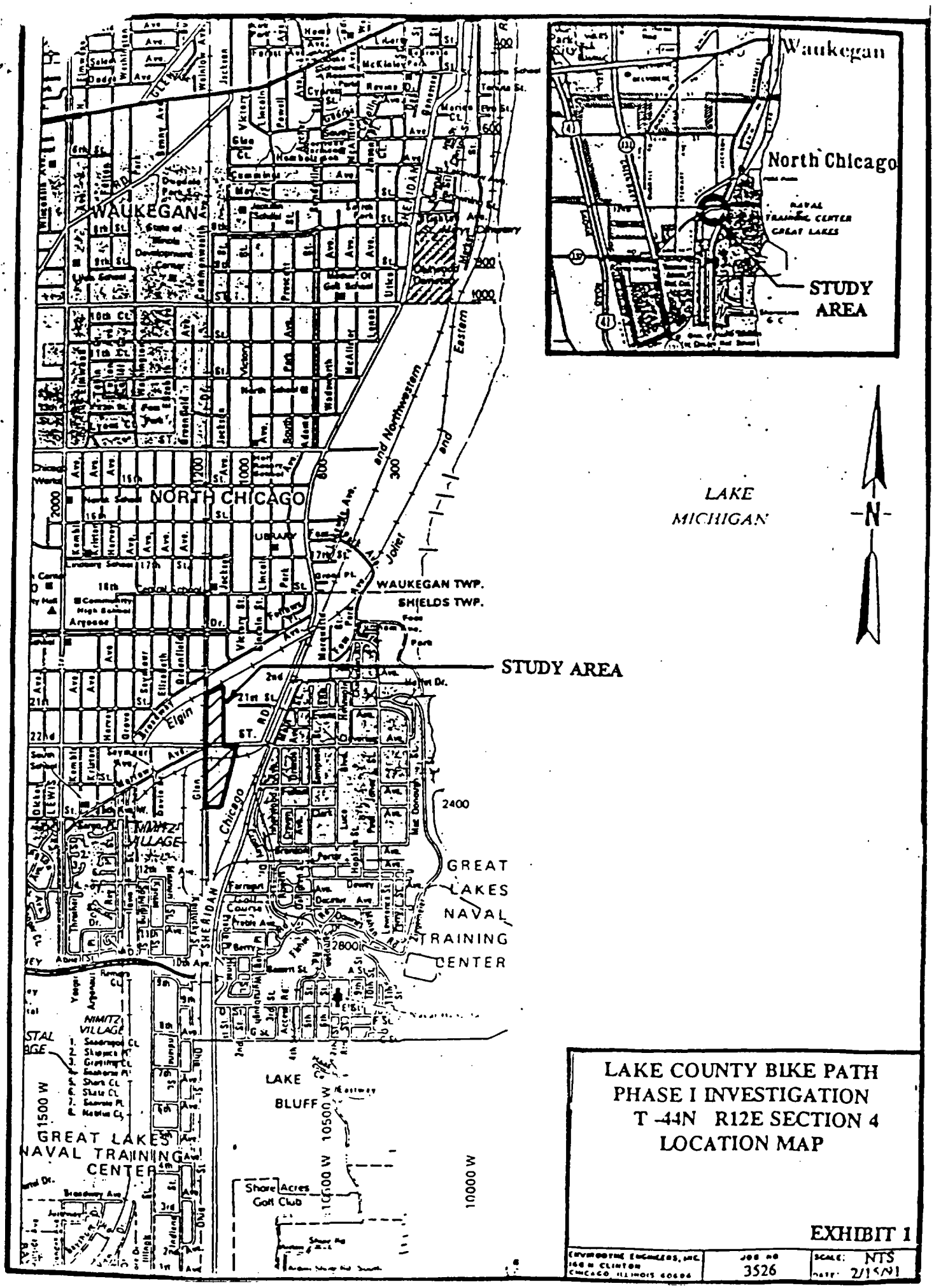
Sincerely,



Bruce J. Yurdin
Manager, Watershed Unit
Permit Section,
Division of Water Pollution Control

cc: Records Unit
CoE, Chicago District
IDNR, OWR, DWRM, Schaumburg
City of North Chicago

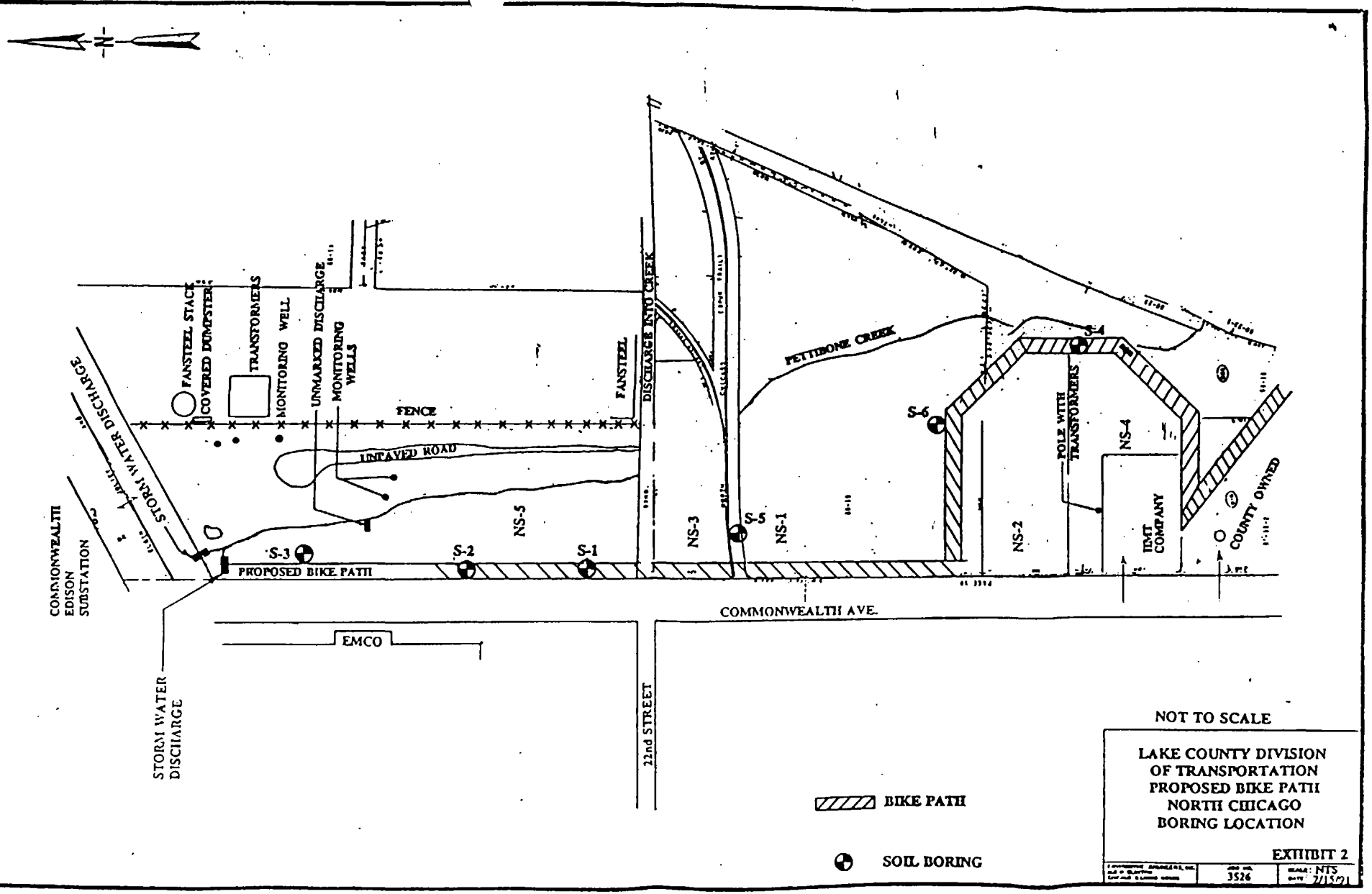

NORTH SHORE
GARDEN
OF
MEMORIES
MARION GRAVES CT.
NORTH CHICAGO COMM. HIGH SCHOOL
NORTH CHICAGO REFINERS AND SMELTERS
GREAT
FAYSTEEL
NAVAL
PETTIBONE
CREEK
TRAINING
GREAT LAKES
NAVAL TRAINING CENTER
FIVE POINTS
BUCKLEY
LEWIS
SPAULDING
EASTERN RR
DOWNEY
VETERANS
HOSPITAL
NAVAL
TRAINING
CENTER
S. West Pettibone Creek Watershed Study Limit



LAKE COUNTY BIKE PATH
PHASE I INVESTIGATION
T -44N R12E SECTION 4
LOCATION MAP

EXHIBIT 1

CRAWFORD ENGINEERS, INC. 140 N. CLINTON CHICAGO, ILLINOIS 60606	JOB NO 3526	SCALE: NTS DATE: 2/15/91


N
FANSTEEL STACK
COVERED DUMPSTER
TRANSFORMERS
MONITORING WELL
UNMARKED DISCHARGE
MONITORING WELLS
FANSTEEL
DISCHARGE INTO CREEK
PETTIBONE CREEK
FENCE
UNPAVED ROAD
STORM WATER DISCHARGE
COMMONWEALTH EDISON SUBSTATION
S-3
S-2
S-1
S-5
S-6
S-4
NS-5
NS-3
NS-1
NS-2
NS-4
POLE WITH TRANSFORMERS
IDOT COMPANY
COUNTY OWNED
PROPOSED BIKE PATH
COMMONWEALTH AVE.
EMCO
22nd STREET
STORM WATER DISCHARGE
BIKE PATH
SOIL BORING
NOT TO SCALE
LAKE COUNTY DIVISION
OF TRANSPORTATION
PROPOSED BIKE PATH
NORTH CHICAGO
BORING LOCATION
EXHIBIT 2
3526
NTS
2/15/21

N4

Table 1

ANALYTICAL RESULTS – 8 RCRA METALS

Borehole locations

**Results (Total PPM)

RCRA Metal	S-1	S-2	S-3	S-4	S-5	S-6	RCRA TCLP Limits *
Arsenic	3.00	1.33	1.2	0.07	1.27	4.00	5.0
Barium	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	100.0
Cadmium	0.26	2.99	0.89	3.26	1.90	2.71	1.0
Chromium	16	24.8	14.9	9.25	12.3	17.2	5.0
Lead	79.3	1250	227	294	125	715	5.0
Mercury	0.03	0.07	0.04	0.03	0.20	0.02	0.2
Selenium	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0
Silver	10.4	2.52	1.13	2.75	2.17	2.81	5.0

* The TCLP (Toxic Characteristic Leaching Procedure) is an analytical method in which acid is used to leach metals from the sample. The concentrations of leachable metals in this column are the limits set by RCRA (Resource Conservation and Recovery Act) to define hazardous waste.

** Analysis results are reported as <u>total</u> metals which includes leachable as well as unleachable metal constituents.

PETTIBONE CREEK BASIN

SYSTEM INVENTORY

General Description

The two branches of Pettibone Creek drain an area of 4.2 square miles and include a unique variety of land uses. These include Crab Tree Acres (a large farm) and Shore Acres Country Club drained by the south branch and the Great Lakes Naval Training Center along with portions of North Chicago, drained by the north. The north branch is extensively stormsewered and contains a dense mix of urban uses. Some of the storm sewers appear to be networked to sewers in the Waukegan River Basin.

Detailed Description

Reach #1

Reach 1 begins at the Lake and extends westerly as a channel through several wooded ravines within the Great Lakes Naval Training Center to the confluence with the north and south branch. The drainageways in the Naval Training Center contain areas of slope erosion and failure with some areas adjacent to buildings and affecting bridges, outfalls and other infrastructure. Sediment has built up near the mouth of the creek in the Naval harbor impacting navigation. Tests of these sediments has revealed a serious level of heavy metal contamination.

Reach #2

Reach 2 begins at the confluence of the branches and extends southwesterly as a channel to the property edge of the Naval Base. Reach 13 enters from the west draining an area near the intersection of Rt. 137 and Sheridan Road.

Reach #3

Reach 3 extends from the Naval Base south to a pond in the Golf Course. Most of the surrounding land use consists of private open space on the west and estate residential areas on the east. Two tributaries enter on the west discharging from minor stormsewers serving areas west of Sheridan Road. One small tributary enters from the east.

Reach #4

Reach 4 consists of a small pond in the golf course. A tributary enters Pettibone from the west just before it discharges to the pond. The surrounding land use consists entirely of private open space.

Reach #5

Reach 5 begins at the pond and extends southerly meandering through Shore Acres Country Club to Arden Shore Road. The terrain in this area is flat to mildly rolling.

Reach #6

Reach 6 extends between Arden Shore Road and Arbor Drive. The creek becomes difficult to view as it flows through a short stretch of large lot single family residential areas.

Reach #7

Reach 7 begins on the south side of Arbor Drive and extends to a small pond just east of Sheridan Road flowing through the Crab Tree Farm, a large open area with various wooded parcels.

Reach #8

Reach 8 includes the small pond and extends through the remainder of the farm to the east side of Sheridan Road where the small farm estate is located. The channel is not distinguishable as it extends west under Sheridan Road and the rail road tracks. The main land use in this reach is agricultural.

Reach #9

Reach 9 begins on the west side of Sheridan Road and extends west to a small pond east of Armour Drive and south of Ascot Court where it serves as a detention area and open space for a large but, more traditional suburban single family residential development extending to Green Bay Road.

Reach #10

Reach 10 begins at its confluence with the main stem of Petti_one Creek and extends northwesterly through an area of institutional buildings as a meandering creek in a ravine-like setting with approximately a 15' bottom width and a 10' depth to Sheridan Road all within the Naval Training Center. A small tributary ravine enters from the west approximately half way up the reach. Approximately 750 feet further upstream a 54" outfall serving the northern portion of the base enters on the right followed by a 48" discharge just before Sheridan Road also draining from the north.

Reach #11

From Sheridan Road, the stream flows in a man-made channel under the Northwestern Railroad and then into a larger channel or degraded ravine through a heavy industrial area. Immediately

upstream from the tracks a 72" stormsewer outfalls on the left bank and a 42" discharges on the right. Medium to large trees line the channel and there is a lot of rubble and debris in the bottom. The channel passes under another set of railroad tracks and 22nd Street leading to a 48" discharge pipe in the vicinity of the EJ&E railroad tracks and Commonwealth Avenue.

Two industries currently are operating under NPDES discharge permits. One industry is permitted under a consent decree from IEPA resulting from regulatory actions relative to water quality violations. During the IEPA investigations, soil and sediments throughout the reach were found to be seriously contaminated primarily with heavy metals. Investigations indicate the contamination continues downstream through the Naval Base to the harbor.[27]

Reach #12

From the discharge point in Reach 11 the watershed is entirely storm sewered with some intermittent and discontinuous overland flow. The area is mostly an older single family residential neighborhood. There are numerous reports of flooded basements and streets in the area due to an inadequate storm sewer system, indiscriminate filling of the natural channel and sanitary sewer surcharging. The City of North Chicago and the SMC are jointly studying this small watershed to define a 100 year flow path. Current mapped basin boundaries are incorrect. City storm sewer information suggests a networked drainage area beyond Argonne up to Greenbay Road. This study should help verify the actual drainage in this area and provide a basis for future investigative efforts.

Reach #13

This reach is a small ravine to Pettibone Creek inside the Naval Base draining a 36" outfall at Sheridan Road potentially draining a closed landfill site once operated by the Navy.

Direct Lake Discharges

There are no major natural drainageways or ravines going directly to the lake in this basin due to the steep bluff morphology. There are approximately ten separate minor outfalls to the lake between the Pettibone Creek outlet and the northern basin boundary. There are three NPDES permitted outfalls, two related to sanitary sewerage and one for non-contact cooling water.

Problem Sites

Potential Water Quality Impacts

No major outfalls exist on the south branch with the exception

of Reach 13 and the land use in the area is mostly residential or open space. However, a good portion of the south branch flows through a golf course and agricultural area. The remainder is residential therefore, lawn care and related agricultural pollutants may be present.

The north branch has five major outfalls within its small reach draining a variety of industrial, commercial, institutional and older residential areas. Areas tributary to Reaches 10 & 11 have a long history of industrial land use which is still active toady. As a result, the adjacent soils and creek sediments are contaminated and this contamination probably is spread with each runoff event.

Numerous homes in Reach 12 are reported to experience basement sanitary back-ups which undoubtedly impact the stormwater discharges to Pettibone Creek.

The drainageways in the Naval Training Center (Reach #1) contain areas of persistent slope erosion and failure threatening buildings and other structures.

Property Damage/Traffic Disruption

The neighborhoods in Reach 12 experience flooded basements, yards and streets. There are no other reported major flooding problems.

Land Use and Population

Existing Conditions

This basin contains 3,040 acres of which 88% is urbanized. Figures show the predominant land uses are residential and institutional with some concentrated pockets of industrial and agricultural.

POPULATION			HOUSEHOLDS		
1980	1990	2010	1980	1990	2010
3,234	3,938	3,960	1,070	1,348	1,508

EMPLOYMENT		
1980	1985	2010
6,261	9,423	11,649

Table 4. Pettibone Creek Demographics. Source: Lake Co. PZEQ and NIPC.

From 1980 to 1990 population totals for the basin increased only slightly.

Future Conditions

Of the remaining undeveloped land area, none is proposed to be developed at this time. Local comprehensive plans indicate that the areas are expected to maintain their current land use for the near future. The navy base has recently been added to a list of bases under consideration for closing. This could be a major change in use of the base but may not disrupt the land areas that much.

Natural Resources

Crab Tree Acres Farm is one of the last large open space parcels along the north shore. No known environmental reports are available on this site but, it does contain numerous mature hardwood stands. Because of the urbanization, no other significant resource in this area exist.

Existing Programs and Studies

As mentioned, the City of North Chicago and SMC are developing a hydrologic study of Reach 12 and the tributary area. The purpose is to develop a 100 year floodplain in the area to better regulate in-fill development and provide a tool to devise solutions to current drainage problems. At the same time the City has been investigating sewer back-ups and has performed some interflow and infiltration studies. Once the stormwater is more efficiently managed and standing water is reduced, it should be easier to determine the problems with the sanitary system.

The Navy has an ongoing effort to maintain slope stability within the base. Some soil and water quality sampling has taken place as part of an environmental assessment and as reported has revealed generally the same type of metal contamination that the IEPA independently discovered in the upstream reaches of the north branch. The specific data from these sampling efforts can be obtained from the IEPA and the Navy.

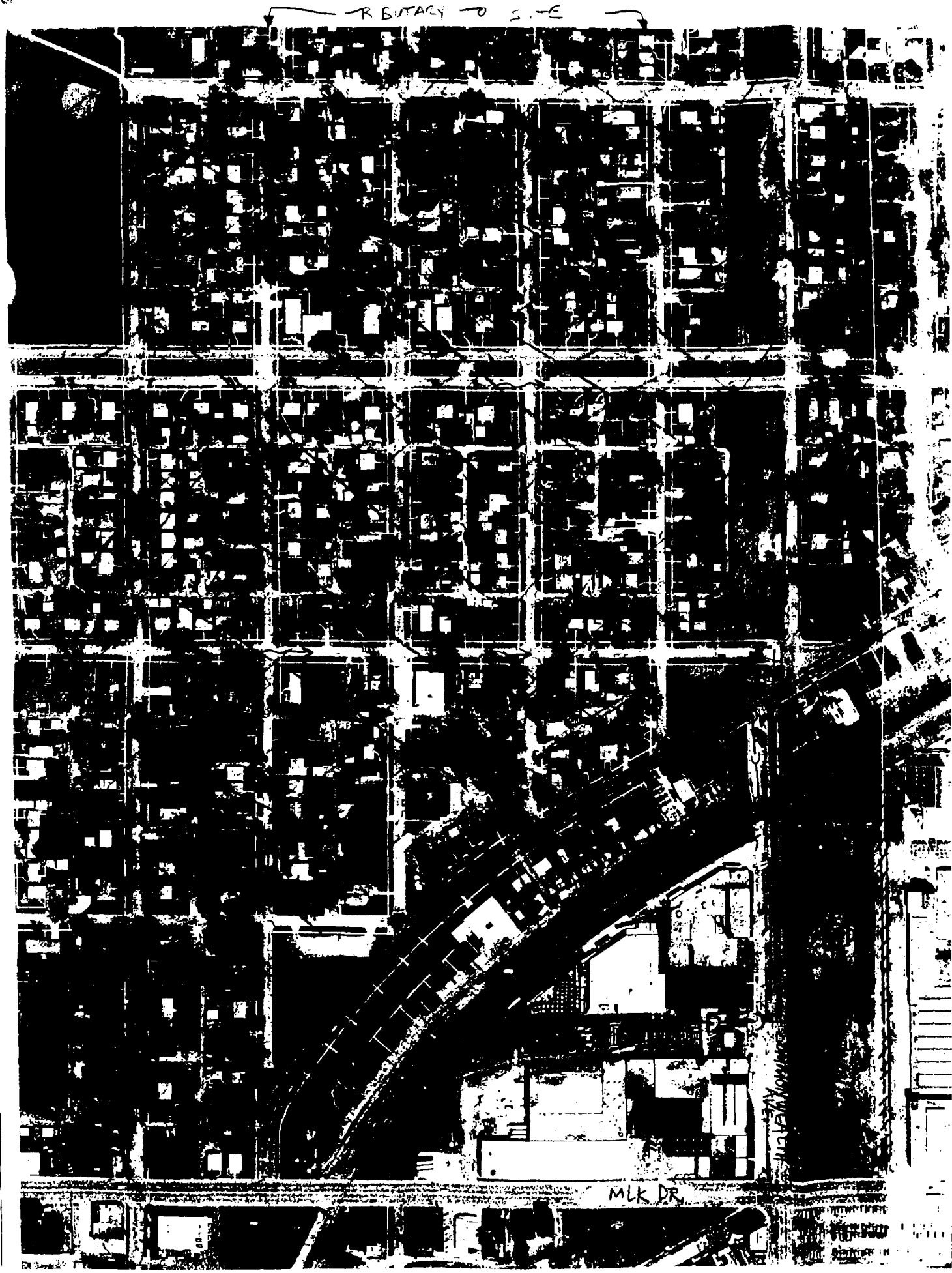
Summary

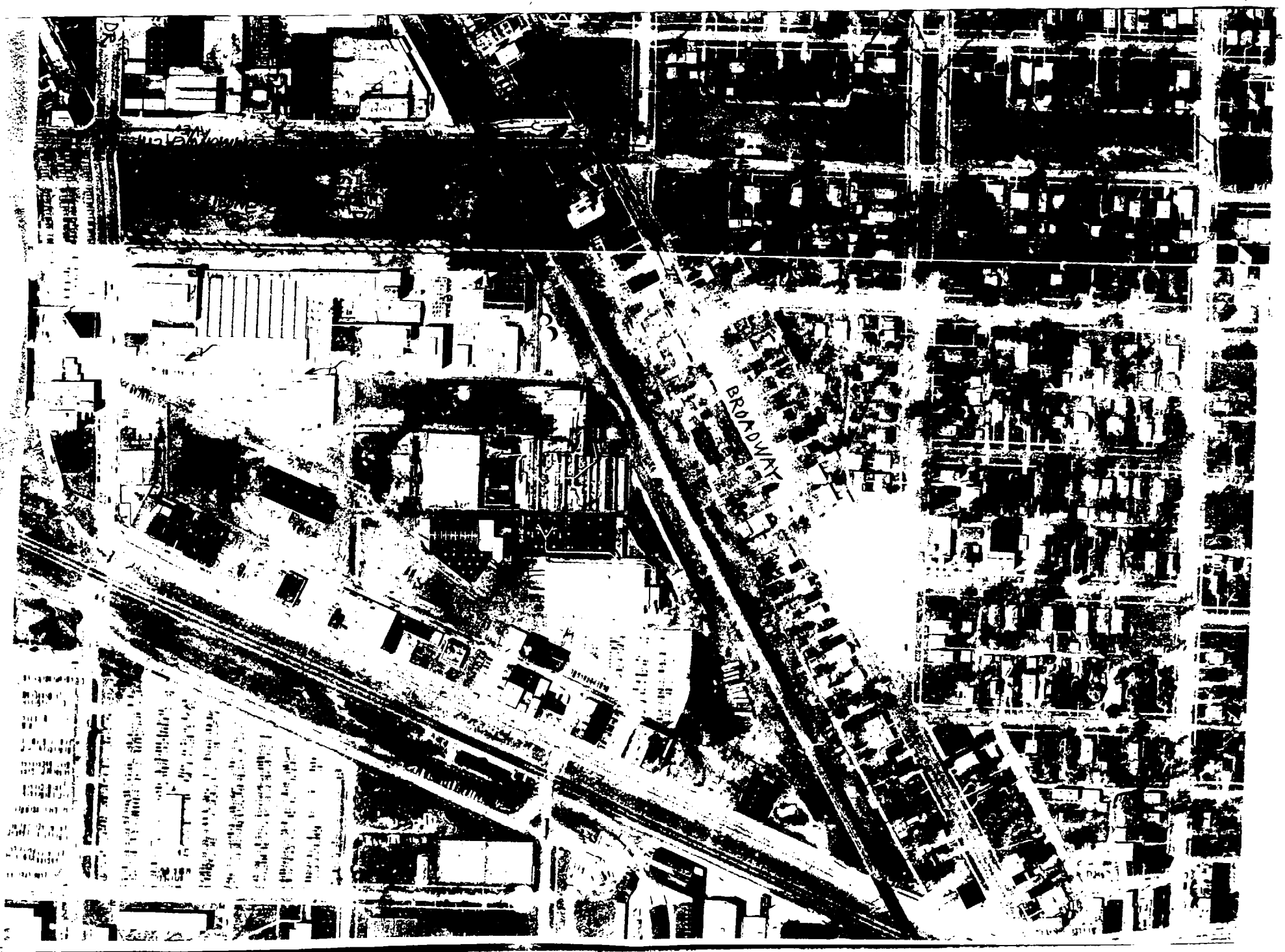
Major problems in the basin include bluff and ravine erosion in the Naval Base, basement flooding in North Chicago and industrial pollution along portions of the creek in North Chicago (Reaches 10 & 11).

The major needs in the Pettibone Creek Basin are channel maintenance and erosion control. Follow-up analysis from the SMC/North Chicago Study that would lead to the development of detention areas would probably help downstream erosion control by reducing some of the peak discharges from the dense urban areas during frequent events. The study should also shed some light on the actual drainage patterns in the area as well as the sanitary inflow.

Currently there are no plans for remediation of the contaminated sediments in the north branch and the harbor. However, the basis for the IEPA investigation and sediment sampling was to "score" the site for possible designation as a super fund site.[27]

The land use in the basin should remain stable. However, if more development is proposed it will be in the south branch and adherence to the SMC Watershed Development Ordinance should prevent any downstream flooding and minimize increases in erosion. Aside from residential in-fill and redevelopment, the only areas available for development are Crab Tree Farm and Shore Acres Country Club. While future development plans are not known for either of these sites, the majority of the Crab Tree Farm is under a conservation easement which has recently come under scrutiny from area taxing bodies.


R BUTACY TO S.E
MLK DR


BROADWAY